

REMARKS/ARGUMENTS

Favorable consideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-15 and 21 are presently pending in this application, Claim 1 having been amended, and Claim 21 having been added. The changes and additions to the claims do not add new matter and are supported by the originally filed specification, for example on original Claim 2 and page 45, line 16 to page 51, line 21.

In the outstanding Office Action, Claims 1, 2, 5, 7, 8, 10, 11, 13, and 15 were rejected under 35 U.S.C. §102(e) as being anticipated by Sugino et al. (U.S. Patent No. 6,853,823, hereafter “Sugino”), or in the alternative, under 35 U.S.C. §103(a) as being unpatentable over Sugino in view of Applicants’ Admissions (see specification, at page 3, line 10 to page 4, line 10; and page 10, lines 12-13 hereafter, “Applicants’ Admission”); Claims 1, 2, and 4-15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Niimi (U.S. Pub. No. 2003/0104295, hereafter “Niimi’295”) in view of Applicants’ Admission, Japanese Patent 200-319538 (hereafter “JP’538”), Ladd et al. (Structure Determination by X-ray Diffraction, hereafter “Ladd”), and Sakai et al. (U.S. Pub. No. 2001/0022343, hereafter “Sakai”); Claim 3 was rejected under 35 U.S.C. §103(a) as being unpatentable over Niimi’295 in view of Sakai, Applicants’ Admission, JP’538, Ladd, and Japanese Patent 11-140337 (hereafter, “JP’337”); Claims 1, 2, 5-8, 10, 11, and 13-15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Niimi (U.S. Pub. No. 2002/0076633, hereafter “Niimi’633”) in view of Applicants’ Admission, JP’538, Ladd, and Sakai; Claim 3 was rejected under 35 U.S.C. §103(a) as being unpatentable over Niimi’633 in view of Sakai, Applicants’ Admission, JP’538, Ladd, and JP’337; Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Niimi’633 in view of Sakai, Applicants’ Admission, JP’538, Ladd, and Niimi et al. (U.S. Pub. No. 2002/0051654, hereafter “Niimi’654”); Claim 9 was rejected

under 35 U.S.C. §103(a) as being unpatentable over Niimi'633 in view of Sakai, Applicants' Admission, JP'538, Ladd, and Tokutake et al. (U.S. Patent No. 6,120,955, hereafter "Tokutake"); Claims 12-13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Niimi'633 in view of Sakai, Applicants' Admission, JP'538, Ladd, and Niimi'654; Claims 1-15 were rejected on the ground of nonstatutory obviousness type double patenting as being unpatentable over Claims 1-37 of Toda et al. (U.S. Patent No. 7,029,810, hereafter "Toda") in view of Sakai, Applicants' Admission, JP'538, and Ladd; Claims 1-3, 5, 6, and 9-15 were rejected on the ground of nonstatutory obviousness type double patenting as being unpatentable over Claims 1, 5-10, and 12-19 of Niimi (U.S. Appl. No. 10/454,556, hereafter "Application'556") in view of Sakai, Applicants' Admission, JP'538, and Ladd; and Claims 1-3, 5, 6, and 10-15 were rejected on the ground of nonstatutory obviousness type double patenting as being unpatentable over Claims 1-24 and 29-35 of Niimi et al. (U.S. Patent No. 7,371,491, hereafter "Niimi' 491") in view of Sakai, Applicants' Admission, JP'538, and Ladd.

With respect to the separate non-provisional rejections on the ground of nonstatutory obviousness type double patenting over Niimi' 491, Application'556, and Toda, Applicants submit herewith terminal disclaimers for Niimi' 491, Application'556, and Toda in compliance with 37 C.F.R. §1.321(c). Applicants note that Application '556 is now U.S. Patent No. 7,419,751 as listed on the terminal disclaimer. Therefore, it is respectfully requested that these grounds of rejection be withdrawn.

With respect to the rejection of Claims 1-15 described above, in which Sugino or Niimi'295 is the primary reference, Applicants submit herewith a certified translation of Applicants' priority application, JP Application No. 2002-263941, to perfect the Applicants' priority date of September 10, 2002. Applicants' note that Sugino's earliest publication date is March 11, 2003. Furthermore, Niimi'295 has a publication date of June 5, 2003 and a

filing date of March 22, 2002. Therefore, with the Applicants' priority date perfected, Niimi'295 is only prior art under 35 U.S.C. §102(e). However, under the provisions of 35 U.S.C. §103(c), Niimi'295 cannot preclude patentability in a rejection under 35 U.S.C. §103 in this case because it is commonly assigned to the same entity as the present application. Therefore, Applicants respectfully request that all rejections of Claims 1-15, in which Sugino or Niimi'295 is the primary reference be withdrawn.

With respect to the rejection of Claim 1, in which Niimi'633 is the primary reference, Applicants respectfully submit that the amendment to Claim 1 overcomes this ground of rejection. Amended Claim 1 recites, *inter alia*,

the electrophotographic photoconductor comprises a charge generation layer and a charge transport layer stacked in this order on a conductive support, and

the charge generation layer contains titanyl phthalocyanine crystals having, as a diffraction peak ( $\pm 0.2^\circ$ ) of Bragg angle  $2\theta$  with respect to  $\text{CuK}\alpha$  ray (wavelength: 1.542 angstrom), a maximum diffraction peak at least at  $27.2^\circ$ , main peaks at  $9.4^\circ$ ,  $9.6^\circ$  and  $24.0^\circ$ , and a peak at  $7.3^\circ$  as a diffraction peak on the lowest angle side, and not having a peak within a range of from  $7.3^\circ$  to  $9.4^\circ$  and at  $26.3^\circ$ , wherein

a dispersion for forming the charge generation layer is prepared by being filtrated through a filter having an effective pore size of  $3\text{ }\mu\text{m}$  or less, and the titanyl phthalocyanine crystals contained in the filtered dispersion have an average particle diameter of  $0.3\text{ }\mu\text{m}$  or less.

Applicants respectfully submit that Niimi'633, Applicants' Admission, JP'538, Ladd, and Sakai fails to disclose or suggest at least these features of Claim 1.

Claim 1 defines an electrophotographic photoconductor used in an electrophotographic apparatus where a surface of the electrophotographic photoconductor exposed requires 200 msec or less to reach a developer, and an exposure energy when the write light having a resolution of 600 dpi or greater is irradiated to the electrophotographic photoconductor is  $5\text{ erg/cm}^2$  or less on the surface thereof. This electrophotographic

photoconductor includes a charge generation layer prepared from a dispersion obtained as follows: titanyl phthalocyanine crystals of a specific crystal type, which serve as a charge generation material, and are dispersed to prepare a dispersion for forming a charge generation layer. The resulting dispersion is filtered through a filter having a specific pore size to adjust the particle diameter of the crystals contained therein to a specific value.

Niimi'633 is directed to an electrophotographic receptor and image forming method. Fig. 3 of Niimi'633 shows an image forming apparatus that includes a photoreceptor 1, a charger 8, a light irradiator 10, an image developer 11, and a transfer device 15a and 15b. In example 28, Niimi'633 describes a charge generation layer made of titanylphthalocyanine, polyvinyl butyral, and 2-butanone (see para. [476]). However, Niimi'633 does not describe that a dispersion for forming the charge generation layer is prepared by being filtrated through a filter having an effective pore size of 3  $\mu\text{m}$  or less, and the titanyl phthalocyanine crystals contained in the filtered dispersion have an average particle diameter of 0.3  $\mu\text{m}$  or less, as defined by amended Claim 1.

Therefore, Applicants respectfully submit that Niimi'633 fails to disclose or suggest "a dispersion for forming the charge generation layer is prepared by being filtrated through a filter having an effective pore size of 3  $\mu\text{m}$  or less, and the titanyl phthalocyanine crystals contained in the filtered dispersion have an average particle diameter of 0.3  $\mu\text{m}$  or less," as defined by amended Claim 1.

Applicants' Admission, JP'538, Ladd, and Sakai have been considered but fail to remedy the deficiencies of Niimi' 633 with regard to amended Claim 1.

In particular, Applicants note that the Office Action also relied on JP'538 as disclosing a charge generation layer comprising titanyl phthalocyanine crystals. JP'538 is directed to organic photoconductive material and its dispersion for an electrophotographic photoreceptor. JP'538 describes using titanyl phthalocyanine crystals for a photoconductor,

and also describes a dispersion medium for the photoconductor (see pages 12-13 of JP'538). However, JP'538 does not describe that "a dispersion for forming the charge generation layer is prepared by being filtrated through a filter having an effective pore size of 3  $\mu\text{m}$  or less, and the titanyl phthalocyanine crystals contained in the filtered dispersion have an average particle diameter of 0.3  $\mu\text{m}$  or less," as defined by amended Claim 1.

Applicants note that the Office Action has previously stated that the features of previously presented Claim 1 are disclosed by Niimi'633 based on Niimi'633 disclosing a similar X-ray diffraction pattern as recited in Claim 1 (see for example, page 23 of the Office Action). However, Applicants submit that the properties of the dispersion solution are not inherently disclosed in either Niimi'633 or JP'538 based on their descriptions of an X-ray diffraction pattern corresponding to the titanyl phthalocyanine crystals described therein.

For example, Applicants specification provides a non-limiting example in manufacturing example 14, in which a filter for the particles of titanyl phthalocyanine was used having an effective pore size of 3  $\mu\text{m}$  (see specification, at page 102, line 21 to page 103, line 20). Applicants' specification also describes manufacturing example 1, in which a filter is not used (see specification, at page 92, line 10 to page 94, line 8). Applicants' Table 3 shows greasing effects between these two examples (see specification, at page 106). Here, the photoconductor of manufacturing example 14 (example 9 in the table) is superior to that of manufacturing example 1 (example 2 in the table) after printing of 50,000 sheets based on having a higher rank of greasing. Also, as described in the specification, a slight existence of coarse particles was microscopically recognized in the non-filtered charge generation layer coating solution used in manufacturing example 1, but existence of coarse particles was not microscopically recognized in the filtered charge generation layer coating solution used in photoconductor manufacturing example 14 (see page 103, line 24 to page 104, line 11). Thus, in manufacturing example 14, where filtration had been performed, was advantageous

in greasing after printing of 50,000 sheets over manufacturing example 1, where no filtration had been performed (see TABLE 3). As described in the specification, moreover, manufacturing example 14 is superior to manufacturing example 1 based on having a halftone image dot with a clearer profile (see specification, at page 106, lines 1-4).

Therefore, Applicants submit that the feature of “a dispersion for forming the charge generation layer is prepared by being filtrated through a filter having an effective pore size of 3  $\mu\text{m}$  or less, and the titanyl phthalocyanine crystals contained in the filtered dispersion have an average particle diameter of 0.3  $\mu\text{m}$  or less,” which is not disclosed in JP’538 or Niimi’633 has effects separate from the X-ray diffraction pattern, and therefore cannot be considered inherent in JP’538 or Niimi’633 based on their disclosure of a particular X-ray diffraction pattern.

Therefore, Applicants respectfully submit that amended Claim 1 (and all associated dependent claims) patentably distinguishes over Niimi’633, Applicants’ Admission, JP’538, Ladd, and Sakai, either alone or in proper combination.

With respect to new Claim 21, Claim 21 recites, *inter alia*,

the charge generation layer contains titanyl phthalocyanine crystals having, as a diffraction peak ( $\pm 0.2^\circ$ ) of Bragg angle  $2\theta$  with respect to  $\text{CuK}\alpha$  ray (wavelength: 1.542 angstrom), a maximum diffraction peak at least at  $27.2^\circ$ , main peaks at  $9.4^\circ$ ,  $9.6^\circ$  and  $24.0^\circ$ , and a peak at  $7.3^\circ$  as a diffraction peak on the lowest angle side, and not having a peak within a range of from  $7.3^\circ$  to  $9.4^\circ$  and at  $26.3^\circ$ , wherein

the titanyl phthalocyanine crystals are obtained by subjecting amorphous or low crystallinity titanyl phthalocyanine having a maximum diffraction peak at least at from  $7.0^\circ$  to  $7.5^\circ$  as a diffraction peak ( $\pm 0.2^\circ$ ) of Bragg angle  $2\theta$  with respect to a characteristic X-ray (wavelength: 1.542 angstrom) of  $\text{CuK}\alpha$ , the half-value width of the diffraction peak being 0.1  $\mu\text{m}$  or greater, and having an average particle diameter of primary particles of 0.1  $\mu\text{m}$  or less to crystal conversion with an organic solvent in the presence of water, and then by separating titanyl phthalocyanine having undergone crystal conversion from

the organic solvent through filtration before it grows to an average particle diameter of primary particles more than 0.3  $\mu\text{m}$ .

Thus, the invention of Claim 21 defines an electrophotographic photoconductor used in an electrophotographic apparatus where a surface of the electrophotographic photoconductor exposed requires 200 msec or less to reach a developer, and an exposure energy when the write light having a resolution of 600 dpi or greater is irradiated to the electrophotographic photoconductor is 5  $\text{erg}/\text{cm}^2$  or less on the surface thereof. The electrophotographic photoconductor includes a charge generation layer prepared from a dispersion of titanyl phthalocyanine crystals of a specific crystal type, which serve as a charge generation material, where the particle diameter of the titanyl phthalocyanine crystals is controlled during synthesis thereof by use of filtration.

Applicants submit that titanyl phthalocyanine crystals having a maximum diffraction peak at  $27.2 \pm 0.2^\circ$  as a diffraction peak of Bragg angle  $2\theta$  with respect to  $\text{CuK}\alpha$  ray (wavelength: 1.542 angstrom) or similar crystals easily transfer to another crystal type, making it difficult to prepare a dispersion containing fine particles. When severe dispersing conditions (e.g., extension of dispersing time and increase of dispersing stress) are set in order for the dispersion to have a certain particle diameter, the crystals transfer to another crystal type, considerably changing the characteristics of the formed photoconductor. This is because only the above-specified crystals are highly sensitive to such conditions. It has been understood that when titanyl phthalocyanine crystals of a desired crystal type are synthesized by subjecting materials obtained from the acid paste process to crystal conversion, crystal transfer occurs together with the crystal growth (see specification, at page 45, line 25 to page 46, line 15). In the invention of Claim 21, crystal conversion of the crystals is caused to effectively proceed during synthesis thereof, and is terminated before they grow greater than a desired particle diameter. The thus-synthesized titanyl phthalocyanine crystals have a small

particle diameter of primary particles and thus dispersing thereof requires no excessive stresses, which avoids the above-mentioned crystal transfer during dispersing.

Additionally, as discussed above with regard to Claim 1, the use of filtration for particle diameters of titanyl phthalocyanine particles provides advantages in greasing and halftone imaging compared to that of examples where there is no filtration (see specification, at table 3).

Furthermore, Applicants respectfully submit that Niimi'633, Applicants' Admission, JP'538, Ladd, and Sakai fail to explicitly disclose or suggest "the titanyl phthalocyanine crystals are obtained by subjecting amorphous or low crystallinity titanyl phthalocyanine having a maximum diffraction peak at least at from  $7.0^\circ$  to  $7.5^\circ$  as a diffraction peak ( $\pm 0.2^\circ$ ) of Bragg angle  $2\theta$  with respect to a characteristic X-ray (wavelength: 1.542 angstrom) of  $\text{CuK}\alpha$ , the half-value width of the diffraction peak being  $0.1\ \mu\text{m}$  or greater, and having an average particle diameter of primary particles of  $0.1\ \mu\text{m}$  or less to crystal conversion with an organic solvent in the presence of water, and then by separating titanyl phthalocyanine having undergone crystal conversion from the organic solvent *through filtration* before it grows to an average particle diameter of primary particles more than  $0.3\ \mu\text{m}$ ," as defined by new Claim 21.

Therefore, Applicants respectfully submit that new Claim 21 patentably distinguishes over Niimi'633, Applicants' Admission, JP'538, Ladd, and Sakai, either alone or in proper combination.



Consequently, in light of the above discussion and in view of the present amendment, the outstanding grounds for rejection are believed to have been overcome. The present application is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

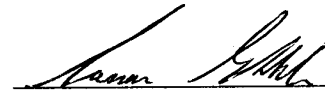
Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

Customer Number

**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 08/07)



James J. Kulbaski  
Attorney of Record  
Registration No. 34,648

Sameer Gokhale  
Registration No. 62,618